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## REMARKS

Claims 1-14 are pending. Reconsideration of the application in view of the following remarks is requested.

**I. Election Restriction Requirement**

Applicants elected, with traverse, Group II directed to a method for treating paper making pulp, comprising alkaline treatment followed by pectate lyase treatment. It is understood that the Examiner has made a restriction requirement and that certain subject matter is not being examined at this time.

**II. The Rejection of Claims 1-14 under 35 U.S.C. 112**

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as indefinite. The Examiner states that the claims have been amended to recite a method for reducing the cationic demand and/or content of anionic trash in a paper making wood pulp, but the method comprises at least a two step-alkaline treatment of the pulp and pectate lyase treatment of the pulp. The Examiner states that the alkaline treatment step produces anionic polygalacturonic acid, which increases the amount of anionic trash/cationic demand, yet the second step decrease the amount of anionic trash/cationic demand. The Examiner states that the method claimed is confusing and creates a contradiction. This rejection is respectfully traversed.

The rejection seems to stem from the incorrect assumption that the alkaline treatment step is included for the specific purpose of increasing the amount of anionic trash/cationic demand. This is incorrect. The alkaline treatment is included for other reasons, in particular, the alkaline treatment is included for bleaching and brightening the pulp, as is well known in the art. Thus, the method of reducing the amount of anionic trash/cationic demand is in the context of a bleaching process. That is, the alkaline treatment is not included to increase the anionic trash/cationic demand, it is included for bleaching and brightening of the pulp. The fact that anionic trash/cationic demand may be increased is irrelevant because, as compared to a process without the pectate lyase treatment, the claimed invention does reduce anionic trash/cationic demand.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 112. Applicants respectfully request reconsideration and withdrawal of the rejection.

**III. The Rejection of Claims 1-7, 10, 12 and 13 under 35 U.S.C. 102(b)**

Claims 1-7, 10, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe et al. with evidence provided by IUBMB Enzyme Nomenclature and Plants for a Future. This rejection is respectfully traversed.

Tanabe et al. describes processes for maceration of bast fibers from the inner bark of mitsumata. As described in Tanabe et al., the maceration is an enzymatic pulping process in which the raw material is soaked and then converted into a pulp by defibration of the bast fibers with the aid of a pectate lyase and pectin lyase.

Tanabe et al. does not anticipate the claimed invention. The claims recite a process of treating a "pulp" with a pectate lyase. A "pulp," as defined in the specification and as understood in the art, is "an aqueous mixture of fibers of plant origin." See the specification at page 3, lines 25-28. In a pulp, the fibers are free floating as single fibers. A "pulp" is not the raw material of Tanabe et al., in which the fibers are not free floating but are instead in the form of a plant tissue which must be subject to maceration/defibration (i.e., pulping) to form a pulp. Accordingly, Tanabe et al. does not anticipate the claimed invention because it does not teach treating "a pulp" as the material treated in Tanabe et al. is a raw material used to prepare a pulp not a "pulp."

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 102. Applicants respectfully request reconsideration and withdrawal of the rejection.

**IV. The Rejection of Claims 1-7, 10, 12 and 13 under 35 U.S.C. 102(b)**

Claims 1-7, 10, 12 and 13 are rejected under 35 U.S.C. 102(b) as anticipated by Kobayashi et al. with evidence provided by Plants for a Future. This rejection is respectfully traversed.

As with Tanabe et al., Kobayashi et al. is also directed to a process of maceration using a pectate lyase and does not teach treating a "pulp." In particular, Kobayashi et al. teach a tissue maceration process using a pectate or pectin lyase to promote defibration. Kobayashi et al. therefore also does not anticipate the claims as it is directed to treatment of raw material to prepare a pulp (i.e., a pulping process), not treatment of a "pulp."

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 102. Applicants respectfully request reconsideration and withdrawal of the rejection.

**V. The Rejection of Claims 1-4, 6-10 and 12-14 under 35 U.S.C. 103**

Claims 1-4, 6-10 and 12-14 are rejected under 35 U.S.C. 103 as unpatentable over Andersen et al. in view of Thornton and IUBMB Enzyme Nomenclature. The Examiner states that Applicants' claimed method is the method of Thornton in which pectinase is replaced by a different enzyme. As stated by the Examiner: "Both are paper making processes and both have the same products-polygalacturonic acid is digested to galacturonic acid and paper is made. Thus, these are not different methods with different products."

This rejection is respectfully traversed. Although Thornton produces galacturonic acid from polygalacturonic acid (see, e.g., Thornton, Example 1) this is not the product or process of the present invention. As is clearly illustrated in Figure 1 (and as discussed in Example 1), the product resulting from the degradation of pectin with pectate lyase differ from the product resulting from the degradation of pectin with pectinase. In particular, pectinases degrade pectin into galacturonic acid whereas pectate lyases degrade pectin into unsaturated 4-deoxy-L-threo-hex-4-enopyranosyluronic acid group through beta-elimination reactions. Thus, it is not true that both Thornton and the present invention have the same products, but rather they are different methods with different products.

Thus, as the two enzymes do not have the same products, there is no motivation to substitute a pectate lyase for a pectinase of Thornton, in particular, in view of Thornton's clear emphasis that the production of galacturonic acid is critical. See Thornton, Example 1 ("if pectin can be degraded to monomers, i.e., galacturonic acid, the cationic demand of the system can be eliminated). Neither Andersen et al. nor IUBMB Enzyme Nomenclature instruct an artisan that the different products produced by a different enzyme would also result in a reduction of the cationic demand of the system in a papermaking process.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

**VI. The Rejection of Claim 5 under 35 U.S.C. 103**

Claim 5 is rejected under 35 U.S.C. 103 as being unpatentable over Andersen et al. in view of Thornton and IUBMB Enzyme Nomenclature. This rejection is respectfully traversed.

As previously discussed, Andersen et al. in view of Thornton and IUBMB Enzyme Nomenclature do not disclose a process for reducing the cationic demand and/or the content of anionic trash in a paper making wood pulp, by treatment of the pulp with a pectate lyase.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

#### **VII. The Rejection of Claim 11 under 35 U.S.C. 103**

Claim 11 is rejected under 35 U.S.C. 103 as being unpatentable over Andersen et al. in view of Thorton, IUBMB Enzyme Nomenclature, and Back. This rejection is respectfully traversed.

As previously discussed, Andersen et al. in view of Thorton and IUBMB Enzyme Nomenclature do not disclose a process for reducing the cationic demand and/or the content of anionic trash in a paper making wood pulp, by treatment of the pulp with a pectate lyase. Back also does not instruct an artisan that the different products produced by a different enzyme would result in a reduction of the cationic demand of the system.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

#### **VIII. The Rejection of Claims 1-14 for Obviousness-Type Double**

Claims 1-14 are rejected under the judicially created doctrine of double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,284,524 ("Andersen et al. I"), or claims 20 and 21 of U.S. Patent No. 6,187,580 ("Andersen et al. II"), or claims 21, 23 and 24 of U.S. Patent No. 6,399,351 (Bjornvad et al.) in view of Thornton.

Obviousness double patenting is a judicially created doctrine grounded in public policy rather than statute. *In re Longi*, 225 U.S.P.Q. 645, 648 (Fed. Cir. 1985). The purpose of this rejection is to prevent the extension of the term of a patent by prohibiting the issuance of the claims in a second patent not patentably distinct from the claims of the first patent. *Id.* The Federal Circuit has indicated that the issue in determining whether an obviousness double patenting rejection is appropriate is "whether the claimed invention in the application for the second patent would have been obvious from the subject matter of the claims in the first patent, in light of the prior art." *Id.*

As explained above, the Examiner's reliance on Thornton is misplaced as it is based on the incorrect assumption that Thornton and the claimed invention both have the same mechanism and products. As previously explained, this is not accurate. The present invention relies on a different enzyme that produces different products. Thornton teaches the importance of preparing galacturonic acid, however, galacturonic acid is not a product of the treatment of pectin with a

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pectate lyase, and one skilled in the art would not expect that a pectate lyase could be substituted for the enzyme of Thorton to obtain a reduction in cationic demand and/or the content of anionic trash in a paper making wood pulp.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

**IX. Conclusion**

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

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